

tions of the zodiacal light, or to "Chambers's Astronomy," 3rd edition, p. 92, where a short chapter is devoted to the subject.

Speaking from my own experience, the zodiacal light is best observed in this neighbourhood during the clear evenings of February or March, in the late twilight, and of course in the absence of moonlight.

On referring to my copy of the *Astronomical Register* for 1875, vol. xiii. p. 196, I find a letter from Mr. T. W. Backhouse in reply to a previous communication from Canon Beechey in the same volume, p. 174, describing what appears to have been a much finer display of this sunset phenomenon as seen by the rev. gentleman from Downham, Norfolk, than either your correspondent or myself witnessed.

Mr. Backhouse states: "It is purely an atmospheric phenomenon ascribed to the sun shining on particles of water or ice."

May I ask if the above explanation is an established fact or only a theory?

I shall be glad if you receive and can make room for the accounts of other observers, as I cannot think the appearance is a very common one—at least not in this neighbourhood.

Hull, April 24

WILLIAM LAWTON

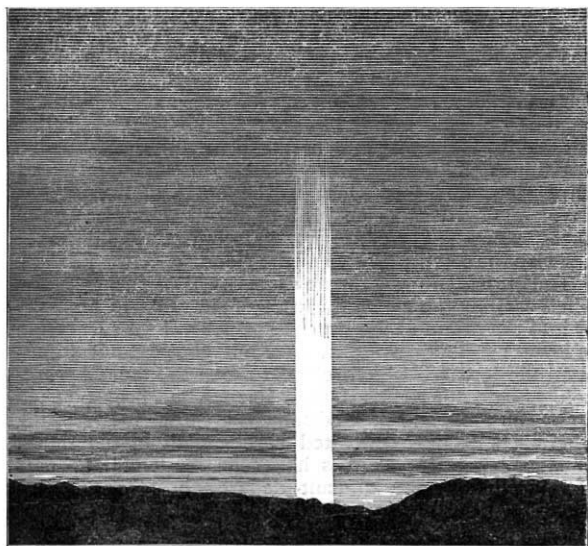
REFERRING to the letters in your columns on this subject, I beg to forward two photographs of the sun, which show distinct horns of light on each side of the disk. They were taken—the sun high in the heavens at the time—some two months ago in a simple camera, without any special arrangement, except a rapid shutter, but the development was undertaken with some care, and arrested as soon as the light fleecy clouds around made their appearance.

H. B. P.

Blackheath, April 27

[We have received the photographs, which are certainly very remarkable if our correspondent can certify that the strange prolongations which appear on them are special to them, and not in any way dependent upon any possible reflection from the lenses employed.—ED.]

THE phenomenon described on pages 580 and 605, under the heading "The Zodiacal Light (?)" was that generally known as a "Sun Pillar." I send herewith an engraving of one seen from Sidmouth in 1871, full descriptions of which were given in the *Meteorological Magazine* for May, June, and July of that year.



Sun Pillar seen near Sidmouth, April 4, 1871.

I believe that it is merely a portion of a halo passing vertically through the sun; in the recent case, that portion of the halo which was above the sun was alone seen, sometimes the portion below it is seen alone, and occasionally both are visible, together with a parhelic circle (or parts of one), and then of course we have the rare phenomenon of the sun as the centre of a luminous cross. I have called this complete phenomenon of

the solar cross rare, for I know of only three occasions of its being seen, and even these I have not verified in the originals, but those interested may search in *Hugenii Opuscula posthuma*, ii. 48, for the details of the phenomenon seen in Cassel in January, 1586, by Roth; and in the *Mém. de l'Acad. des Sciences* for 1693 and 1722, for descriptions by Cassini and Malézieux.

G. J. SYMONS

62, Camden Square, N.W.

THE curious luminous projection after sunset on the 6th inst., noticed by several of your correspondents, was also seen for some time very soon after sunset in Herefordshire. Its shape was somewhat like a vertical pillar of soft, hazy, yellowish, luminous light, about the width of the solar disk, 10° in height above horizon, and finishing rather abruptly with a conical termination in a clear sky.

R. P. GREG

Coles, Buntingford, Herts, April 29

ALLOW me to call the attention of such of your readers as are interested in the above phenomenon, to a communication from Mr. J. J. Murphy of Belfast, in your issue of July 13, 1876, and to another from myself, a fortnight later, describing a sun pillar seen in the north of Ireland on June 27, 1876.

R. V. D.

Beragh, co. Tyrone, April 28

Mock Moons

THE mock moons mentioned in your last week's issue (p. 606), by Mr. Mott, were seen here. The circle subtended an angle of 50°. When first seen, a line drawn through the mock moons passed through the moon itself. At 11 p.m. such a line was 3° above the moon. At 1 a.m. the appearance was as at first. This change of level of the refracting cloud is what Mr. Mott alludes to when he says it "seemed to be unaccountably out of place." I was not aware that there was any fixed place for the brighter portions of the halo.

SM.

Temple Observatory, Rugby

The Freshwater Medusæ

IT may interest some of your readers to know that the little freshwater Medusæ (*Limnocoedium Sowerbii*), which appeared in the Victoria Regia Tank here on June 9, 1880, for the first time, again on June 12, 1881, and not at all during 1882, appeared again in the tank on Saturday morning, April 28, many of them being full grown individuals. The tank, which remains empty during the winter, was filled with water on March 8.

April 30

W. SOWERBY

The Circles of a Triangle

CANNOT the method of "portmanteau" words be advantageously applied? I beg leave to suggest the following names: *circumcircle*, *incircle*, *excircle*, and *midcircle*; these are for speech, in print or writing they might appear C \odot , I \odot , E \odot , M \odot .

April 28

W. H. H. H.

Flight of Crows

IN watching crows as they fly overhead, I often think they are not flying straight forward, but have the line from head to tail at an angle of about fifteen degrees with the line of flight. Can this be corroborated? I do not like to trust my own observing powers in such a matter.

JOSEPH JOHN MURPHY

Old Forge, Dunmurry, co. Antrim, April 24

METAMORPHIC ROCKS OF SCANDINAVIA AND SCOTLAND

MUCH interest attaches to the researches of the Swedish geologists among the older crystalline rocks of Scandinavia. In the year 1873 Mr. A. E. Törnebohm published an important paper in which he showed that in the high grounds of Sweden Lower Silurian rocks, with recognisable fossils, pass up conformably into a vast overlying series of quartzites, schists, and gneisses. These metamorphic rocks were divided by him into two groups—the Seve group, composed mainly of quartzites and schists, and the Kôli group, consisting

largely of mica-schists and clay-slates. In another memoir just published he furnishes additional information regarding the succession of these rocks. The old or fundamental (Archæan) rocks composed of gneiss, granite, &c., are overlain by thick masses of reddish sandstones, followed by quartzites and limestones, over which come Augen-gneiss, hornblende-schist, mica-schist, &c. This order of sequence, which is shown in numerous natural sections, will be at once recognised as that which Murchison first showed to be the stratigraphical succession in the north-west of Scotland. It is interesting to find that the parallelism which was traced many years ago between the structure of the Highlands of Scotland and the uplands of Scandinavia continues to be confirmed by the more detailed surveys of recent years.

OBSERVATION OF THE GREAT COMET OF 1882

(Communicated by Vice-Admiral Rowan, Superintendent U.S. Naval Observatory)

1883.	Washington mean time.	Comet - +.			No. of comps.	Mag. of star.
		a.				
April 4	h. m. s. 8 29 49.8	m. s. - 2 17 59	- 1 17 6	12, 4	8	
Comet.	log. (p × Δ)	Comet.	log. (p × Δ).	Obs'r.	Comp. star.	
a App.		δ App.				
h. m. s. 5 57 20.58	s. 9.5575	- 9 18 27.5	0.7877	F.	W 1449	

Mean Place of Comparison Star

Star.	a. 1883'o.	δ. 1883'o.	Authority.
W 1449	h. m. s. 5 59 37.14	- 9 16 53.4	Bessel.
Date.	Obs. Δ a.	Comp. Δ δ.	Eph.
1825.	s. + 4.06	" + 14	NATURE, vol. xxvii. p. 226, and <i>Ast. Reg.</i> No. 243, p. 72.

This observation was made with the 26-inch equatorial, and compared with the following of three bright points in the nucleus. If we had compared the middle point of the nucleus with the comet, the corrections would have been $\Delta a = + 1.3$ $\Delta \delta = + 0.3$.

Washington, April 6

E. FRISBY,
Prof. Math., U.S.N.

ANTHROPOLOGY¹

I.

THE invitation to lecture on anthropology with which I have been honoured gives me freedom to speak both of the races of mankind zoologically, and also of the thoughts, arts, and habits which form their civilisation.

¹ Two lectures on "Anthropology," delivered on February 15 and 21 at the University Museum, Oxford, by E. B. Tylor, D.C.L., F.R.S.

It is on the development of civilisation that I especially wish to dwell, a subject of direct interest always and to all, and the more opportune now that the practical question of the instalment of a Museum of Civilisation in Oxford is under discussion. Still, man's bodily and mental history so act and interact on each other that it is well to carry on their study together. Both depend on the great principle of adaptive change, where rise in organisation gives fuller and freer existence, till "correspondence with the environment" fixes a more or less permanent state, or suppression or disuse brings on degeneration. These are processes systematised in the theories of development or evolution which have of late years become predominant, and which seek to account for the change of plants and animals on the earth by modified descent, and of mental and moral phenomena by modified sequence. There is a consideration I wish to bring prominently forward, as not having had the attention it deserves. It is that these processes of development, or evolution, or transformism were long ago recognised to no small extent by ethnologists. Thus Prichard, the leader of the monogenist school forty years ago, brought forward evidence for the derivation of the races of mankind from one original ancestral pair, whom he considered to have been negroes, whose descendants more or less varying by the operation of natural causes became modified or transformed into the various races adapted for life in the various climates of the earth. But this, so far as it goes, is the very theory of development or modified descent. Any ethnologist who argues on natural grounds "that all the races of man are descended from a single primitive stock," is an evolutionist within these limits; in fact these words are quoted not from Prichard or Quatrefages, but from Darwin. Within the last generation the science of man has had new evidence and argument brought within its range. The discovery that men were already making rude flint implements in the Quaternary period, when the contours of hill and valley were quite other than during the few thousand years known to chronology, has made a new scientific departure, placing primæval man in the hands of the geologists, who are now discussing whether he even existed in the yet more vastly remote Tertiary period. A yet greater move has been made by Darwin's systematic application of the principles of variation of breeds or races to account for the transitions between species or genera. How these have become transformed in the course of geological time is seen in Huxley's plate of the bones of the four-toed Orophippus, followed by the three-toed Miohippus and Hipparion, and this again by the horse of the present day. Zoologists thus enabled to reconstruct ideally the ancestry of the horse, are hopeful some day to discover likewise the fossil pedigree of the rider.

Thus it is plain why the new lines of biological research, whether into the general causes of variation in animals, or into the origin of the human species from a succession of lower mammalian forms, have not checked but stimulated the research which relates to man as man. Anthropologists do not feel as if their science had been plucked up by the roots and planted somewhere else; it is growing where it was, only cultivated higher than in old times. What substantial progress has been made of late years is well seen in the difficult department of craniology. That there really is something in the shape of a skull will be admitted when one compares the two before us on the table, types which illustrate an interesting point in the early history of our own country. The narrower skull belonged to one of that dolichocephalic Stone Age population whose remains were buried in the long-barrows on our downs. The broader skull belonged to one of the brachycephalic men of the later round-barrows. In the work of Greenwell and Rolleston will be found the anatomical comparison of these skull-types, and the evidence that the earlier tribes were not exterminated by the later